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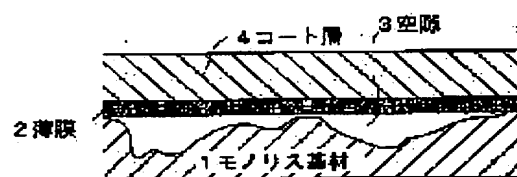
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(54) EXHAUST GAS CLEANING CATALYST

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an exhaust gas cleaning catalyst, wherein a matrix is inhibited from being deteriorated so as to prevent the catalyst from deteriorating in strengths, e.g. thermal shock resistance.

SOLUTION: This catalyst has a thin film 2 comprising a porous oxide between an alkali-metal-carrying coat layer 4 and a matrix 1. The catalyst can be prevented from being deteriorated in strengths because the ability of the film 2 to inhibit the alkali metal from reacting with the base prevents the matrix from changing in composition.



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CLAIMS

[Claim(s)]

[Claim 1] a base material, the thin film which is formed in the front face of this base material, and consists of an oxide, and the coat layer which consists of porosity support which was formed in the front face of this thin film, and supported noble metals and alkali metal at least -- since -- the catalyst for emission gas purification characterized by becoming.

[Claim 2] Thickness of said thin film Catalyst for emission gas purification according to claim 1 characterized by being 100 micrometers or less.

[Claim 3] Said thin film is a catalyst for emission gas purification according to claim 1 characterized by having formed precipitate of a metal hydroxide in said base material front face according to the acid-alkaline reaction, having calcinated it and being formed.

[Claim 4] a base material and the coat layer which consists of porosity support which was formed in the front face of this base material, and supported noble metals and alkali metal at least -- since -- the catalyst for emission gas purification which is a becoming catalyst for emission gas purification, and is characterized by for the die length which this base material and this coat layer touch by the hit in the unit length of this coat layer having come out comparatively, and making a certain contact rate into 30 - 85%.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention] This invention relates to the catalyst for emission gas purification which improved reinforcement, such as thermal shock resistance, in detail about the catalyst for emission gas purification used for an exhaust air system etc. from an automobile engine.

[0002]

[Description of the Prior Art] In recent years, the global warming by the carbon dioxide poses a problem, and it has been a technical problem to reduce the discharge of a carbon dioxide. Also in an automobile, reduction of the amount of carbon dioxides in exhaust gas serves as a technical problem, and the lean burn engine to which lean combustion of the fuel is carried out in a hyperoxia ambient atmosphere is developed. According to this lean burn engine, the discharge of a carbon dioxide can be controlled by improvement in fuel consumption.

[0003] It is NO_x, making it always burn on the fuel Lean conditions of hyperoxia in this lean burn engine, and using exhaust gas as reducing atmosphere by considering as fuel SUTOIKI - rich conditions intermittently. The system which carries out reduction clarification is developed and put in practical use. And as the optimal catalyst for this system, it is NO_x at fuel lean atmosphere. NO_x by which occlusion was carried out by carrying out occlusion NO_x emitted in a fuel SUTOIKI - rich ambient atmosphere NO_x using occlusion material The catalyst for emission gas purification of an occlusion reduction type is developed.

[0004] For example, the catalyst for emission gas purification which supported alkaline earth metal and Pt (s), such as Ba, to porosity oxide support, such as gamma-aluminum 2O₃, is proposed by JP,5-317652,A. Moreover, publication number The catalyst for emission gas purification which supported alkali metal and Pt(s), such as K, to porosity oxide support, such as gamma-aluminum 2O₃, is proposed by 6 No. -31139 official report. Furthermore, the catalyst for emission gas purification which supported rare earth elements and Pt(s), such as La, to porosity oxide support, such as gamma-aluminum 2O₃, is proposed by JP,5-168860,A.

[0005] This NO_x If an occlusion reduction type catalyst is used, exhaust gas will also consist pulse-like of lean atmosphere with a SUTOIKI - rich ambient atmosphere by controlling an air-fuel ratio to consist pulse-like of a fuel Lean side a fuel SUTOIKI - rich side. Therefore, at the Lean side, NO_x is NO_x. It is NO_x even if it is exhaust gas from a lean burn engine, since it reacts with reducibility components which occlusion is carried out to occlusion material, and it is emitted by the SUTOIKI - rich side, and are contained so much in exhaust gas, such as a hydrocarbon (HC) and a carbon monoxide (CO), and is purified. It can purify efficiently. Moreover, HC and CO in exhaust gas are NO_x while oxidizing with noble metals. Since it is consumed by reduction, HC and CO are also purified efficiently.

[0006]

[Problem(s) to be Solved by the Invention] By the way, with the catalyst for emission gas purification for automobiles, while stabilizing and holding in the emission way of an automobile and raising the touch area of exhaust gas and a catalyst component, it is necessary to control buildup of a pressure loss as much as possible. Then, from the former, it is cordierite etc. The base material of the honeycomb configuration formed from MgO, aluminum2O₃, and SiO₂ multiple oxide is used, and many monolithic catalysts in which the coat layer which consists of porosity support which supported the catalyst component was formed on the front face of this base material are used.

[0007] However, NO_x It sets to the monolithic catalyst of an occlusion reduction type, and is NO_x. In the thing using alkali metal as occlusion material, degradation of a base material arose while in use, and it became clear that reinforcement, such as thermal shock resistance, falls compared with other catalysts, such

as a three way component catalyst. Therefore, it is necessary to raise the frequency of exchange and there is nonconformity that the cost per unit time is high.

[0008] This invention is made in view of such a situation, and it aims at preventing lowering of reinforcement, such as thermal shock resistance, by controlling degradation of a base material.

[0009]

[Means for Solving the Problem] the thin film which the description of the catalyst for emission gas purification of this invention which solves the above-mentioned technical problem is formed in the front face of a base material and a base material, and consists of an oxide, and the coat layer which consists of porosity support which was formed in the front face of a thin film and supported noble metals and alkali metal at least -- since -- it is in becoming.

[0010] Thickness of a thin film It is desirable that it is 100 micrometers or less, and, as for a thin film, it is desirable to form precipitate of a metal hydroxide in a base material front face according to an acid-alkaline reaction, and to calcinate and form it.

[0011] moreover, the coat layer which consist of porosity support which the description of the catalyst for emission gas purification of another this invention which solve the above-mentioned technical problem be formed in the front face of a base material and a base material, and supported noble metals and alkali metal at least -- since -- it be the catalyst for emission gas purification become, and be in the die length in which it appear and which be hit in the unit length of a coat layer, and the base material and the coat layer touch having come out comparatively, and having make a certain contact rate into 30 - 85%.

[0012]

[Embodiment of the Invention] Invention-in-this-application persons inquired wholeheartedly about the cause of degradation of a base material. For example NO_x which used as the base material the structures, such as cordierite which consists of MgO, aluminum₂O₃, and SiO₂ multiple oxide, and supported noble metals and alkali metal With the catalyst for emission gas purification of an occlusion reduction type, it became clear that a coefficient of thermal expansion becomes high compared with what does not contain alkali metal. If a coefficient of thermal expansion becomes high, thermal shock resistance will fall and reinforcement will fall.

[0013] And when support distribution of the alkali metal in the catalyst which the above-mentioned nonconformity produced was investigated, alkali metal existed also in the base material. Therefore, it was solved that it is in the reaction of a base material component (especially SiO₂) and alkali metal arising from the interface of a coat layer and a base material preferentially as a cause of the above-mentioned nonconformity, and the multiple oxide presentation of a base material changing.

[0014] So, in this invention, it is considering as the configuration between which it was placed between the base material and the coat layer by the thin film which consists of an oxide. By having considered as such a configuration, it is avoided that the alkali metal and the base material in a coat layer contact directly, and it can control the reaction of alkali metal and a base material component. Therefore, it is controlled that a base material presentation changes and it can prevent strong lowering.

[0015] Moreover, with another catalyst for emission gas purification of this invention, the die length which the base material and the coat layer touch by the hit in the unit length of a coat layer comes out comparatively, and a certain contact rate is made into 30 - 85%. The reaction of the alkali metal in a coat layer and a base material component occurs from the contact interface of a coat layer and a base material preferentially. Therefore, since the contact interface of a coat layer and a base material is reduced by having constituted in this way, the probability for the alkali metal and the base material in a coat layer to contact directly becomes low, and can control the reaction of alkali metal and a base material component.

[0016] As a base material, it is cordierite etc. Although MgO, aluminum₂O₃ and SiO₂ system multiple oxide, TiO₂-aluminum₂O₃ system multiple oxide, and Si₃N₄ etc. was illustrated, it excelled especially in thermal resistance. MgO-aluminum₂O₃ and a SiO₂ system multiple oxide are desirable. The configuration of this base material will not be restricted especially if a touch area with exhaust gas, such as porosity configurations, such as a honeycomb configuration and foam, reticulated, and a pellet type, is big. Moreover, what carried out the coat of the powder of the above-mentioned base material to the base formed from the metallic foil etc. can also be used as a base material.

[0017] As a thin film which consists of an oxide, alkali metal, the thing which cannot react easily or alkali metal, and what does not react and the thing which was further excellent in the adhesive property with a base material and a coat layer are desirable. As construction material of such a thin film, oxides, such as an alumina, a zirconia, a titania, yttria, Seria, and a spinel, or the multiple oxide which consists of two or more of these sorts is illustrated preferably. The oxide contained in a coat layer and especially a thing of the same

kind are desirable.

[0018] Thickness of this thin film It is desirable that it is 100 micrometers or less. The thickness of a thin film If it exceeds 100 micrometers, since the property of the thin film itself affects the property of the whole catalyst and a coefficient of thermal expansion increases rapidly, it is not desirable. Moreover, as for the thickness of a thin film, it is desirable to be referred to as at least 5 micrometers or more. If the thickness of a thin film becomes thinner than 5 micrometers, it will become difficult to prevent the shift to the base material of the alkali metal in a coat layer, and the response probability of alkali metal and a base material component will become high.

[0019] In order to form a thin film in a base material front face, there is the approach of calcinating, after making the powder of the oxide used as the source of a thin film adhere. In this case, the thin film of desired thickness can be formed by adjusting the particle size and coating weight of oxide powder. In addition, since it will be hard coming to form a precise thin film and the reaction of the alkali metal in a coat layer and a base material will become easy to advance if the particle size of oxide powder exceeds 5 micrometers, as for the particle size of oxide powder, it is desirable to be referred to as 5 micrometers or less.

[0020] Burning temperature The range of 600-1500 degrees C is desirable. Burning temperature At less than 600 degrees C, it becomes difficult to form a precise thin film and the reaction of alkali metal and a base material component comes to arise. Moreover, since the heat-resistant temperature of cordierite is 1500 degrees C, as for the upper limit of burning temperature, considering as 1500 degrees C is desirable.

[0021] Moreover, when forming a thin film in a base material front face, precipitate of a metal hydroxide can be formed in a base material front face according to an acid-alkaline reaction, and it can also be calcinated and formed. For example, if a base material is immersed into a zirconium-nitrate water solution and ammonia is added there, precipitate of zirconium hydroxide deposits on a base material front face. The thin film of a zirconia can be formed in a base material front face by calcinating this.

[0022] Although countless irregularity exists in base material front faces, such as cordierite, microscopically, by the approach of making the above-mentioned oxide powder adhere and calcinating, it is difficult even in a detailed crevice to form a thin film, a thin film came to have covered a crevice, and an opening may be formed between a thin film and a base material front face. In such a case, the opening may be transmitted and the alkali metal in a coat layer may invade into a base material.

[0023] Then, especially the thing for which a thin film is formed by the approach using the above-mentioned acid-alkaline reaction is desirable. Since the precipitate generated according to the acid-alkaline reaction which is a reaction of a molecular level is very detailed, the crevice where a base material front face is detailed is also entered, and a thin film is formed. Therefore, it is prevented that an opening is formed between a thin film and a base material front face, and it can control the reaction of alkali metal and a base material component further.

[0024] Moreover, a thin film can also be formed with PVD or a CVD method.

[0025] the coat layer was supported by porosity support and porosity support -- it consists of noble metals and alkali metal at least. Many things can be chosen from aluminum $2O_3$, ZrO_2 , TiO_2 , CeO_2 , etc. as porosity support, and it can use. You may use independently, and two or more kinds may be mixed, these oxides may be used, and it can also use as two or more sorts of multiple oxides. For example, from the point of catalytic activity, it is . It is desirable that aluminum $2O_3$ is included, and if TiO_2 is mixed, sulfur-proof poisoning nature will improve. Moreover, if the CeO_2 or CeO_2 - ZrO_2 solid solution is mixed, clarification activity will improve by the oxygen occlusion bleedoff ability.

[0026] In order to form a coat layer in a thin film front face, it can carry out like the case where it forms in the conventional base material front face, and the approach of calcinating, after covering a slurry etc. can be used.

[0027] As noble metals, it can choose from Pt, Rh, Pd, Ir, Ru, etc., and can use. Among these, a kind is sufficient and two or more kinds can also be supported. The amount of support is per 1l. of catalysts. About 0.1 - 20 % of the weight is desirable.

[0028] K, Na, Cs, etc. are illustrated as an alkali metal. The amount of support of alkali metal has the desirable range of 0.01-1.0 mols per 1l. of catalysts. It is NO_x if fewer than this range. SiO_2 amount which will be consumed if occlusion ability becomes low and supports across this range increases, and the reinforcement of a base material comes to run short of.

[0029] Moreover, NO_x In the case of an occlusion reduction type catalyst, it is also desirable to support either [at least] alkaline earth metal or rare earth elements in addition to alkali metal. Ba, Be, calcium, Mg, Sr, etc. are illustrated as an alkaline earth metal. Moreover, as rare earth elements, Sc, Y, La, Yb, Nd, Sm, etc. are illustrated. In addition, for SiO_2 , since it does not react, alkaline earth metal and rare earth elements

are per 1l. of catalysts as usual. Considering as 0.1-2 mols is desirable.

[0030] With another catalyst for emission gas purification of this invention, a thin film is not formed, but the die length which the base material and the coat layer touch by the hit in the unit length of a coat layer comes out comparatively, and a certain contact rate is made into 30 - 85%. Thus, since the contact interface of a coat layer and a base material is reduced by having constituted, the probability for the alkali metal and the base material in a coat layer to contact directly becomes low, and can control the reaction of alkali metal and a base material component. If a contact rate becomes lower than 30%, although it is hard coming to generate the reaction of alkali metal and a base material component, since the bonding strength of a coat layer and a base material falls, the reinforcement of the catalyst for emission gas purification will become low. Moreover, if a contact rate becomes higher than 85%, the response probability of alkali metal and a base material component will become high.

[0031] Thus, in order to make a contact rate into 30 - 85%, it can carry out to preparation by adjusting the surface roughness of a base material.

[0032] In addition, the catalyst for emission gas purification of this invention is NO_x that what is necessary is just what contains alkali metal in a coat layer. An occlusion reduction type catalyst and NO_x Depending on an absorption catalyst or the case, it can use as a three way component catalyst, an oxidation catalyst, etc.

[0033]

[Example] (Example 1) After preparing the monolith base material of the honeycomb configuration made from cordierite (2MgO, 2aluminum2O₃, and 5SiO₂) and making alpha alumina powder with a mean particle diameter of 1 micrometer adhere, in atmospheric air, it calcinated at 1000 degrees C for 5 hours, and the thin film was formed. The thin film of the thickness of five to 120 micrometer was formed for the coating weight of alpha alumina powder as two or more levels, respectively among per [50g-300g] 1l. of monolith base materials.

[0034] next, the wash coat of the slurry which uses gamma alumina powder as a principal component is carried out to a monolith base material with the thin film of various thickness, respectively -- 250 degree C - - inside of after [desiccation] atmospheric air It calcinated at 300 degrees C for 2 hours, and the coat layer was formed, respectively. A coat layer is each per 1l. of monolith base materials. It is 180g.

[0035] And after being immersed and pulling up a monolith base material with a coat layer and a thin film using the dinitrodiammine platinum nitric-acid solution of predetermined concentration It calcinated at 500 degrees C for 2 hours, and Pt was supported, respectively. The amount of support of Pt is all. It is 0.1 g/L. subsequently, impregnation of the specified quantity of the potassium-nitrate water solution of predetermined concentration is carried out -- 250 degree C -- after 20-minute desiccation It calcinated at 500 degrees C for 30 minutes, and the potassium was supported. The amount of support of a potassium is all. They are 0.3mol/L.

[0036] (Example 1 of a comparison) The catalyst of the example 1 of a comparison was prepared like the example 1 except having not formed a thin film.

[0037] <A trial and assessment> Each catalyst is arranged on an engine bench. It is whenever [space-velocity 80000h⁻¹ and catalyst floor temperature] about the exhaust gas from the gasoline engine of a cylinder. The durability test passed on 800-degree C conditions for 50 hours was performed. Then, the conversion of the coefficient of thermal expansion of each catalyst, a potassium, and a monolith base material component was measured.

[0038] Measurement of conversion extracted the potassium [activity / in a catalyst] with water first, measured the amount (Q₁), and measured the amount of potassiums of the subsequent whole catalyst (Q₂), and the amount of potassiums in a coat layer (Q₃) with the atomic absorption method. And conversion was computed by the degree type. Each result is shown in drawing 1 .

[0039]

Conversion = 100x(Q₂-Q₃)/(Q₁+Q₂)

It is more distinct than drawing 1 by forming a thin film that conversion is falling greatly. That is, since the reaction of a base material component and a potassium is controlled by forming a thin film, lowering of the reinforcement of a monolith base material can be prevented. However, since the effectiveness is [the thickness of a thin film] very small in less than 5 micrometers, as for the thickness of a thin film, it is desirable to be referred to as 5 micrometers or more.

[0040] On the other hand, even if it forms a thin film, the thickness If it is less than 100 micrometers, buildup of a coefficient of thermal expansion is slight. However, the thickness of a thin film Since the coefficient of thermal expansion is remarkably large if it exceeds 100 micrometers, it is the thickness of a

thin film. It turns out that it is desirable to be referred to as 100 micrometers or less.

[0041] (Example 2) It is alpha alumina powder similarly using the same monolith base material as an example 1. In the inside of atmospheric air after carrying out 100 g/L adhesion It calcinated for 5 hours, respectively with the various temperature levels of the range of 200-1500 degrees C, and the thin film was formed. The thickness of a thin film is 50 micrometers, respectively. And the coat layer was formed like the example 1, respectively, and Pt and a potassium were supported similarly, respectively.

[0042] About each acquired catalyst, the durability test was performed like the example 1 and the conversion of a potassium and a monolith base material component was measured like the example 1 after that. A result is shown in drawing 2.

[0043] The burning temperature of a thin film from drawing 2 Burning temperature since conversion is high at less than 600 degrees C It turns out that it is desirable to consider as 600 degrees C or more. In addition, since the heat-resistant temperature of cordierite is 1500 degrees C, it is necessary to make burning temperature into 1500 degrees C or less.

[0044] (Example 3) Mean particle diameter using the same monolith base material as an example 1 Alpha alumina powder of two or more levels while being 0.1-10 micrometers After making it adhere 100 g/L, respectively, in atmospheric air, it calcinated at 1100 degrees C for 5 hours, and the thin film was formed, respectively. And the coat layer was formed like the example 1, respectively, and Pt and a potassium were supported similarly, respectively.

[0045] About each acquired catalyst, the durability test was performed like the example 1 and the conversion of a potassium and a monolith base material component was measured like the example 1 after that. A result is shown in drawing 3.

[0046] If the particle size of alpha alumina powder exceeds 5 micrometers, conversion becomes high and is not more desirable than drawing 3. This is considered because the eburnation of the thin film is hard to be carried out. Therefore, it is clear that powdered particle size's 5 micrometers or less are desirable.

[0047] (Example 4) It replaces with alpha alumina, each powder of a zirconia, a spinel, yttria, Seria, and a titania-zirconia multiple oxide is used, and it is each. After carrying out 100 g/L adhesion, it calcinated like the example 1 and each thin film was formed. And the coat layer was formed like the example 1, respectively, and Pt and a potassium were supported similarly, respectively.

[0048] About each acquired catalyst, the durability test was performed like the example 1 and the conversion of a potassium and a monolith base material component was measured like the example 1 after that. A result is shown in drawing 4. In addition, the result of the example 1 of a comparison is also shown in drawing 4, and the axis of abscissa is set as the thickness of a thin film.

[0049] Drawing 4 shows that the reaction of a potassium and a base material component is controlled like the thin film of alpha alumina, even if it is the thin film formed from other oxides or multiple oxides other than alpha alumina.

[0050] (Example 5) The aqueous ammonia of the specified quantity was mixed in the zirconium-nitrate water solution of predetermined concentration, promptly, it was immersed, predetermined time maintenance of the same monolith base material as an example 1 was carried out, and precipitate of zirconium hydroxide was deposited on the monolith base material front face. After that, it calcinated after 2-hour desiccation at raising and 250 degree C, and the monolith base material was calcinated at 1000 degrees C in atmospheric air for 3 hours. Thickness it is thin on a monolith base material front face from a zirconia by this The 2.5-micrometer thin film was formed. The coat layer was formed in the thin film front face like the example 1 after that, and Pt and a potassium were supported similarly.

[0051] (Example 6) The thin film was formed like the example 1 except having replaced with the zirconium-nitrate water solution and having used the aluminium nitrate water solution of predetermined concentration. The thickness of a thin film is 6 micrometers. The coat layer was formed in the thin film front face like the example 1 after that, and Pt and a potassium were supported similarly.

[0052] About the catalyst of <trial / assessment> examples 5 and 6 and the example 1 of a comparison, after performing a durability test like an example 1, the conversion of a potassium and a monolith base material component was measured similarly. A result is shown in drawing 5.

[0053] Drawing 5 shows that the reaction of a potassium and a base material component is controlled like an example 1 - an example 4, even if it is the thin film formed of the acid-alkaline reaction. And even if the thickness of a thin film is thin as compared with drawing 1, it turns out that conversion can be made low. The following reasons can be considered to this.

[0054] That is, since much detailed irregularity exists in the front face of the used monolith base material 1, mean particle diameter like an example 1 Even if it makes the alpha alumina powder which is 0.5

micrometers adhere, it may become difficult to make it fully adhere even to a crevice, and an opening 3 may be generated between a thin film 2 and the monolith base material 1 like drawing 6 . Therefore, the potassium currently supported by the coat layer 4 contacts the monolith base material 1 through an opening 3, and it is easy to produce the reaction of a potassium and a base material component.

[0055] Since the particle size of precipitate of the metal hydroxide produced on the other hand according to the acid-alkaline reaction which is a reaction of a molecular level is very detailed, it deposits also on the front face of the crevice 10 of the monolith base material 1. Therefore, as shown in drawing 7 , between formed thin film 2' and the monolith base material 1, it is hard to produce an opening 3, and hard to produce the reaction of a potassium and a base material component.

[0056] (Example 7) The monolith base material with which surface roughness differs variously using what processed it into the mold of extrusion molding was formed using the same monolith base material as an example 1. And except having not formed a thin film, the coat layer was formed like the example 1, respectively, and Pt and a potassium were supported similarly, respectively. The contact percentage of the coat layer and monolith base material in each catalyst was 20 - 85% as a result of measurement with the electron microscope photograph of a cross section.

[0057] (Example 2 of a comparison) It is the same as that of an example 7 except the contact percentage of a coat layer and a monolith base material being 95%. This catalyst is equivalent to the conventional catalyst.

[0058] About the catalyst of <trial / assessment> example 7 and the example 2 of a comparison, after performing a durability test like an example 1, the conversion of a potassium and a monolith base material component was measured similarly. Moreover, the reinforcement of the monolith base material in the catalyst before a durability test was measured with the compressive strength measuring instrument. Each result is shown in drawing 8 .

[0059] If the contact rate of a coat layer and a monolith base material exceeds 85%, conversion is too high and is not more desirable than drawing 8 . Moreover, although conversion is low as the contact rate of a coat layer and a monolith base material falls, when smaller than 30%, the reinforcement of a monolith base material is too low, and there is no **** in practical use. Therefore, it is clear that the contact rate's of a coat layer and a monolith base material it is desirable to consider as 30 - 85% of range.

[0060] (Example 8) Using the monolith base material with surface roughness as typically shown in drawing 9 , except having not formed a thin film, the coat layer was formed like the example 1 and Pt and a potassium were supported similarly. The contact percentage of the coat layer and monolith base material in this catalyst is 50% as a result of measurement with the electron microscope photograph of a cross section.

[0061] (Example 9) Using the monolith base material with surface roughness as typically shown in drawing 10, except having not formed a thin film, the coat layer was formed like the example 1 and Pt and a potassium were supported similarly. The contact percentage of the coat layer and monolith base material in this catalyst is 40% as a result of measurement with the electron microscope photograph of a cross section.

[0062] After performing a durability test like [catalyst / of <trial / assessment> example 8 and an example 9] an example 1, the conversion of a potassium and a monolith base material component was measured similarly, respectively. Moreover, the reinforcement of the monolith base material in the catalyst before a durability test was measured with the compressive strength measuring instrument. Each result is shown in drawing 11 . In addition, the result of the catalyst of the example 2 of a comparison is also shown in drawing 11 .

[0063] Although reinforcement falls a little by considering as a surface roughness configuration as shown in drawing 9 and drawing 10 from drawing 11 , it is clear that the reaction of a potassium and a base material component is controlled.

[0064]

[Effect of the Invention] That is, according to the catalyst for emission gas purification of this invention, since the reaction of the alkali metal in a coat layer and a base material component is controlled, lowering of the reinforcement of a base material can be controlled. Therefore, since there is no nonconformity to which the thermal shock resistance of a base material becomes low even if it uses alkali metal as a support component, duration of service to degradation can be lengthened and the cost per unit time can be reduced.

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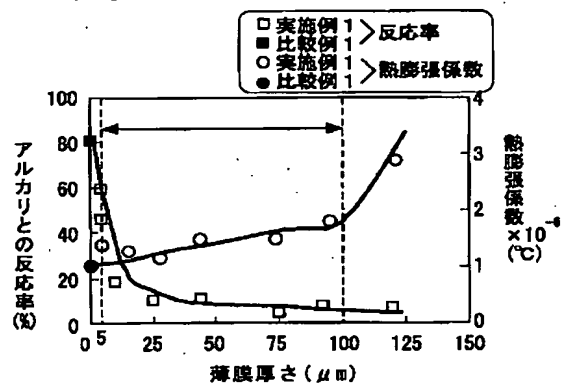
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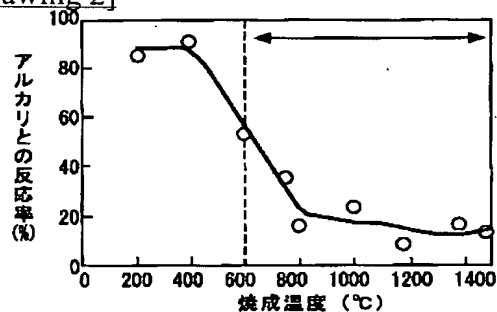
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DRAWINGS

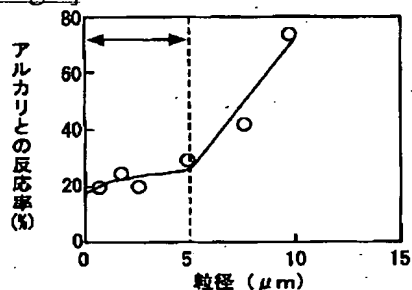
[Drawing 1]



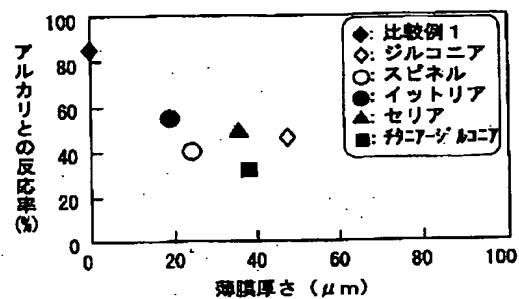
[Drawing 2]



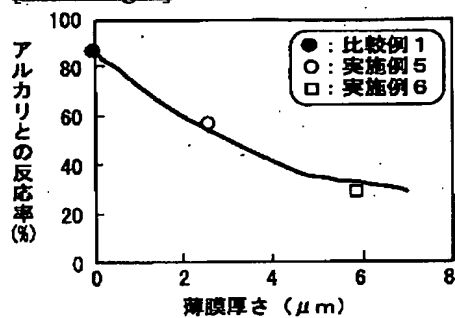
[Drawing 3]



[Drawing 4]



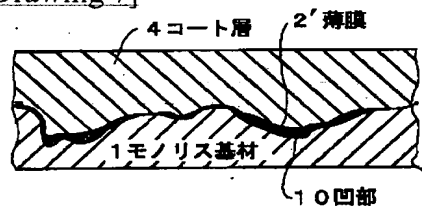
[Drawing 5]



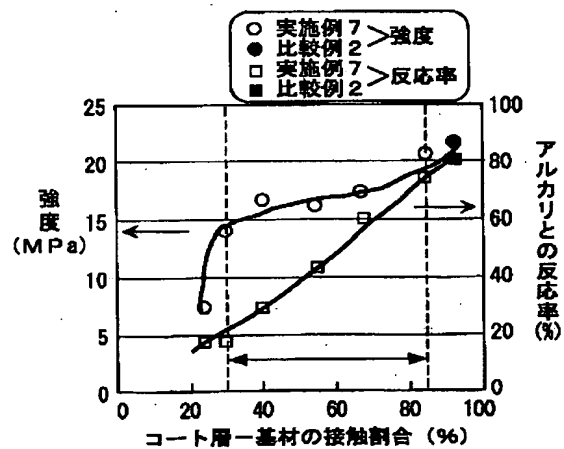
[Drawing 6]



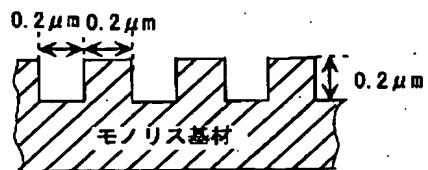
[Drawing 7]



[Drawing 8]



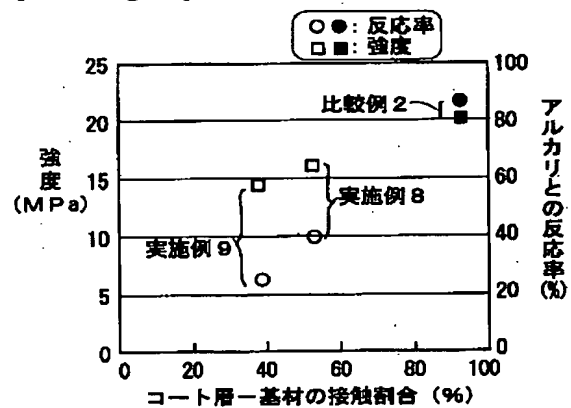
[Drawing 9]



[Drawing 10]



[Drawing 11]



[Translation done.]

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